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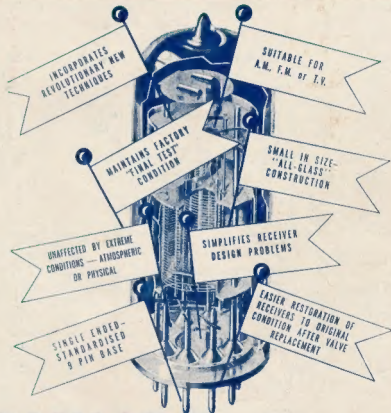
# Amateur Radio

JOURNAL OF  
THE WIRELESS  
INSTITUTE OF  
AUSTRALIA

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and Radio Enthusiast



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## WI BROADCASTS

All Amateurs are urged to keep these frequencies clear during, and for a period of 15 minutes after, the official Broadcasts.

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**VK1WI:** Sundays, at 1000 hours EST, on 7196 Kc. and 146.5 Mc. No frequency checks are available.

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## EDITORIAL



## An Open Letter

During recent months the hobby of Amateur Radio has received a greatly increasing amount of publicity in the columns of commercial periodicals. This is very good; we heartily endorse publicity of Amateur activities for at no other time has the need been more urgent than in this era of international tension and critical change in world affairs and living standards that, from the electronic point of view, is tending to make inroads on the already reduced bandwidths for which the Amateurs have so justly earned the right to use over the past three decades.

That the interesting and worthy activities of the Amateurs should be widely known by the general public is beyond argument. But at the same time they should be factually presented and embrace the Commonwealth and its Territorial Mandates.

In this respect it has been all too evident that the Commercials see little further than one State of the

Commonwealth, thus leading the readers to presume that the entire hub of the Wireless Institute of Australia revolves round this State, and in some instances the information presented in the columns of these papers has not been accurate.

We feel safe in saying that the Editors have not intended that such an impression be created, but a wider knowledge of Amateur activities by the writers of these columns would not only be of great value to Amateur Radio generally, but would also create a worthwhile increase in the number of readers.

It is not intended that undue criticism be levelled against these commercial papers who have sufficient faith in the hobby of Amateurs to preserve space month after month to publicise their activities. At the same time we would direct attention to the one-eyed point of view expressed by their columnists in addition to misrepresenting, in many cases, the true facts.

FEDERAL EXECUTIVE.

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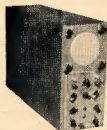


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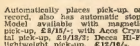
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# Twin Doublet Antenna With Alternative Phasing

BY DON B. KNOCK,\* VK2NO

One of the simplest yet most effective antenna systems for transmission and reception is the twisted pair doublet. Apart from those systems designed for wide frequency response in reception, the fundamental half wave doublet, as fed in the centre by a twisted pair or other low impedance line near enough to effect a reasonable match, is strictly a one-band antenna.

Although a certain amount of directivity is obtainable from such a system erected approximately one half wavelength above ground (if you don't think so, try one rotary and see), the polar diagram is really such as to render it almost omni-directional.

A twisted pair doublet is very suitable for general communication in all directions where space is limited. In most suburban plots a length of about 70 feet is available in one direction or another and so advantage may be taken of this

Just before the 1939-45 War, two G Amateurs, GZTD and GSZJ, worked out a simple but ingenious scheme, in which two half wave twisted-pair doublets are used together for 20 metre operation, and in which the phasing can be changed at will at the operating position.

Fig. 1 shows how the two doublets are erected. Each is 0.97 of a half wave in length and supported, end to end, by an insulator as shown. As the matching delta is  $4\frac{1}{2}$ " in each doublet, this amount of spacing is used for the insulation between the two antennae. 75 ohm Telcon or co-axial cable can be used, but the former is more desirable, being a balanced system.

The originators used the pre-war 80 ohm Belling Lee line and stated that with 100 feet lengths of line on 20 metres, the losses were negligible. Insulation in feedlines has improved enor-

antenna system will work best in phase, and is not at all directional out of phase. If the doublets are quite symmetrical, they will both draw the same amount of load current, but if they have been affected by the proximity of any large object, such as a house, the one nearest to the object will need to be pruned for resonance.

This antenna scheme is one of the countless systems tried through the passage of years at the writer's station and it can be recommended as a sure-fire performer on the band it is designed for. For the man with plenty of ground space, two such doublets cut for 40 or 80 metres would be well worthwhile, for the reason that at these lower frequencies the usual practice is to erect some form of radiator for omni-directivity, and to leave it at that. Usable directivity at 40 or 80 metres would certainly be worth having.

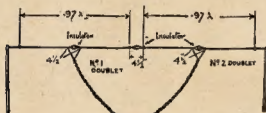
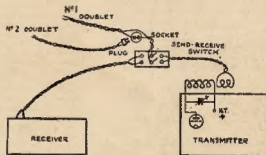


Fig. 1 (above).—The two doublet aeriels are suspended end-to-end with feeder lines of equal length.

Fig. 2 (at right).—The connection scheme to transmitter and receiver.



to erect a system which, for 20 metres, is either effective as two half waves in phase if centre fed, or as one full wave with four lobes of approximately 40 degrees if end or single wire fed in an unbroken length.

The s.w.f. method has the advantage that such an antenna can be used as a half wave on 40 metres. Another method of feeding a 67 feet length of wire for use on 20 is by twisted pair, co-ax, or other low impedance line at a point one quarter wave from one end. 300 ohm ribbon can be used successfully also.

In these instances, the antenna is a four lobe type, but can be used only on 20 metres. Four-lobe coverage as a full wave antenna on 20 and a half wave on 40 is obtainable also by the use of a tuned feeder at one end; in other words the ever-useful "Zepp."

It is apparent that with a 67 feet "top" it would be an advantage to be able to change the radiation pattern at will from the full wave to that of two half waves in phase; the latter having considerable advantage in greatly increased gain with broadside directivity.

mously since then, so that yet higher efficiency can be expected from modern material.

The twin feeders are brought into the transmitting room and connected in series. By reversing one feeder the phase is reversed in one antenna so that the polar pattern is changed.

Fig. 2 shows how this is arranged in the shack. A two-pin socket is used in series with one feeder side from one doublet and the two feeders from the other doublet are plugged in as required. It is a simple matter to remove this plug and to replace it with the pins in the opposite sockets. A d.p.d.t. switch or relay is needed for transmit/receive but the wire feeders should be played out as little as possible.

The feeder lengths from the two doublets should be as symmetrical as possible, even if a feeder has to be made longer than really necessary and then given a special "detour" in order to get them both of the same length.

Furthermore, the feeders should not be coiled in any circumstances. If one feeder is longer than the other, the

## CHANGE OF ADDRESS

W.L.A. members are requested to promptly notify any change of address to their Divisional Secretary, not direct to "Amateur Radia."

## REDUCING NOISE IN DOUBLE CONVERSION RECEIVERS

Excessive noise in double conversion receivers can be reduced by using a triode as a second mixer. All that is necessary with conventional converter tubes is to tie the screen to the plate. In the writer's case the receiver used a type 6K8 to convert from 1600 Kc. to 455 Kc. Although sensitive, the receiver was unduly noisy. The suggested modification was effective in dropping the noise to a low level without materially affecting the sensitivity.

\* 43 Yanko Avenue, Waverley, Sydney.





commencement of vertical synch. pulses. Consider the interval between the last horizontal and the first vertical pulses.



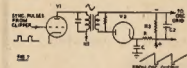
At the end of the first field, it would be shorter than at the end of the second field, as shown in Fig. 6. The small charge left on the integrator, by this last pulse, has therefore less time to escape so that at the end of the first field, charge on integrator reaches its peak faster.

In every picture, therefore, the first field would be "cut short," so that interlacing would not be correct. The lines of the second field would tend to "overlap" those of the first, instead of falling between them.

To prevent this, we substitute some of the horizontal synch. pulses, both before and after each set of vertical synch. pulses, with narrow pulses, at twice line frequency, to equalize conditions for each type of field.

Now it's apparent that the deflection oscillators described can be "triggered" not only by synch. pulses, but by any interfering signal of sufficient amplitude to "penetrate" the clipper. Sure enough, one of the greatest problems in television is to prevent synchronisation from being upset by interference which, by the way, can be caused by Hams as we'll learn later.

A television project which has received much attention overseas is the development of synch. systems sufficiently selective to respond to only the orthodox signals and "ignore" interference. Many interesting circuits have resulted, mostly employing automatic frequency control, and to understand what this means, we'll study one of the simplest circuits of this type, shown in Fig. 7, used for horizontal deflection control.



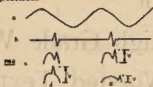
Synch. pulses excite the tuned-plate circuit of the valve V1, setting up an oscillatory sine wave current, at line frequency (15,625 c/s.). The induced secondary voltage is mixed, in the diode V2, with the pulses in Fig. 8b, which are produced by feeding back part of the deflection oscillators' saw-tooth output to the differentiator circuit, RC.

Fig. 8c shows the rectified resultant voltage which appears across R2 and is applied as bias to the grid of the deflection oscillator, which may be the type shown in Fig. 2. C2 has such a value as to filter out rapid changes in this voltage, but preserve the gradual changes required for frequency control. In most cases, V1 and V2 are combined into one duo-triode valve.

Now the pulse frequency of a blocking oscillator depends partly upon the grid bias. The more negative we make the grid, the lower the pulse frequency.

Now consider the voltage developed (Fig. 8) across R2. It is the instantan-

eous sum of the pulse and sine wave voltages, as shown by v in Fig. 8c. Bias on oscillator grid depends on this. The "hold" control can be set so that bias is correct (for required frequency) when pulse falls half way between zero and crest of sine wave, as in Fig. 8c, and any change in oscillator's output frequency will cause this pulse to change its position.



An increase in the saw-tooth frequency causes the pulse to occur sooner in the sine wave, so that the sum voltage v is increased as in Fig. 8d. The consequent increase in negative bias will "slow the oscillator down" to the required frequency.

Conversely, a decrease in saw-tooth frequency places the pulse in a later phase of the sine wave, so that sum voltage v is reduced, as in Fig. 8e, causing a decreased negative bias which "speeds oscillator up" till normal frequency is restored.

We see, therefore, that in this circuit the pulses control the frequency of the oscillator, instead of merely "triggering" it, thus permitting the use of tuned filter circuits to help reject interference.

By now, we should all be sufficiently acquainted with the general principles of television, to be ready to deal with the subject of interference. We have had to "wade" through a lot of theory, to reach this stage, but no doubt you will agree that it's been worth while.

Article eight will therefore deal with the interference problems which television will impose on the Ham. Meanwhile, keep those queries rolling in. They indicate your interest in these articles, and we are glad to receive and answer them.

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- 7CJ—A. E. Finch, 13 Augusta Rd., New Town Hobart.

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 2XK—11 Sutherland Street, Cramers.  
 2XN—5 Excelsior Road, Cronulla.  
 2AN—C/o. Knight and Canning, Quirindi.  
 2ASB—Lawley House, Canberra, A.C.T.  
 2ATV—Cable Station, Norfolk Island.  
 2AWP—"Plantation," Moree.

### Victoria

- 3CG—c/o. Post Office, The Basin.  
 3MK—18 Hourigan Avenue, Clayton.  
 3YN—46 Bellevue Street, Rosanna.  
 3ADK—3 Westley Avenue, Ivanhoe.  
 3APK—Ranger Hamlet & Russell Streets, Quarry Hill, Bendigo.  
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### Queensland

- 4AO—349 Buckland Rd., Wavell Heights, Brisbane.  
 4DB—11 First St., Railway Estate, Townsville.  
 4NG—1 Dobbs Street, Rockhampton.  
 4SE—188 Adelaide Street, Maryborough.  
 4GK—188 Arguington Ave., Eagle Farm, Brisbane.  
 4XR—9 Garrick Street, Gympie.

### South Australia

- 3MR—Pomona Road, Stirling West.

### Western Australia

- 6AS—Rutherford Street, Manjimup.  
 6FA—Lot 436, Evelyn Street, Gosnell.  
 6RC—43 Park Street, Osborn Park.  
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### Tasmania

- 7MY—"Waterloo," Sandford.

### Territories

- 9GW—c/o. O.T.C., 3½ Mile, Port Moresby.

### DELETIONS

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- 2FH—Cancelled; now operating under VK3AFU.  
 2JL—Cancelled.  
 2JSE—Cancelled; now operating under VK9AU.  
 2AET—Cancelled.  
 2AGP—Cancelled; now operating under VK3JGT.  
 2AEP—Cancelled.  
 2ARL—Cancelled; now operating under VK6LQ.  
 2AVS—Cancelled.

### Victoria

- 2ABG—Cancelled.  
 2ADD—Cancelled.  
 2APK—Cancelled.  
 2ARH—Cancelled; now operating under VK6HL.  
 2AVK—Cancelled; now operating under VK6VK.

### Queensland

- 4BA—Cancelled.  
 4HY—Cancelled; now operating under VK3AHY.  
 4KD—Cancelled; now operating under VK6VB.  
 4LA—Cancelled.  
 4LU—Cancelled.  
 4NB—Cancelled.  
 4TH—Cancelled.  
 4YH—Cancelled; now operating under VK3ART.

### South Australia

- 5KO—Cancelled.  
 5XO—Cancelled.

### Western Australia

- 6CA—Cancelled.  
 6ND—Cancelled.

### Territories

- 9CJ—Cancelled; now operating under VK7CJ.  
 9QK—Cancelled; now operating under VK3QK.

Manufacturers of . . .

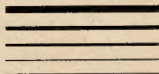
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# USING RESISTORS AS R.F. LOADS

THE practice of testing an Amateur transmitter while it is coupled to an antenna is quite common, despite the fact that the P.M.G. frowns on such doings. While testing an antenna system, of course, it is necessary to be on the air, but for most transmitter tests a dummy load is desirable. Use of a dummy antenna not only obviates unnecessary QRM, but, if a known dummy load is employed, quantitative measurements of actual power output can be obtained.

The purpose of this article is to explain how to procure a good dummy load, and how to use it.

## TYPES OF DUMMY LOADS

Anything which will absorb power and not act as an efficient r.f. radiator may serve as a dummy load. As we know, an electric light bulb can be used. As a matter of fact, it is possible to use a tub of salty water as a dummy load. In actual practice most Amateurs use either a light bulb or non-inductive resistors.

Electric light bulbs have one big disadvantage, and that is, their resistance varies with the amount of current passing through them. If the resistance of a dummy load is not known accurately, then it is impossible to make any accurate output measurements. However, in the case of the light bulb, Amateurs judge output by the amount of brilliance in the lamp. Unfortunately this can be most misleading, because a large change in the amount of power dissipated may be indicated by an imperceptible change in brilliance.

Non-inductive resistors are perhaps the logical choice for use as dummy loads, if only because they have fewer disadvantages than other types of loads. The cost of these units is surprisingly low, and properly handled, they will be a permanent investment. For this reason, all further discussion will be restricted to the use of resistors as dummy loads.

## RESISTORS IN GENERAL

Many different types of resistors are currently manufactured, but those in widespread use fall into two general categories: the composition type and the wire-wound type. Composition resistors are seldom used for dissipation of more than 2 watts. Wire-wound resistors are available with dissipation ratings up to 200 watts.

Composition types of  $\frac{1}{4}$ ,  $\frac{1}{2}$ , 1 and 2 watt ratings are made in resistance values from 10 ohms to 10 megohms. For lower resistance values, these same wattage ratings can be obtained in wire-wound units only. For example, one manufacturer makes  $\frac{1}{4}$  watt wire-wound units in the resistance range from 0.47 ohms to 820 ohms.

Wire-wound units can be obtained in resistance ranges from a few tenths of an ohm to 250,000 ohms, but not all wattage ratings and styles are available over this complete resistance range.

All resistors will not serve as usable dummy loads. Those which are usable are the composition type and the non-inductive wire-wound type. The criteria here is lack of inductance.

The wire-wound inductive resistor will not serve as a dummy load at radio frequencies because its relatively high inductance will not permit a current flow unless a tremendous voltage is available.

For example, assume that a regular inductive resistor has an inductance of 100 millihenrys, and a resistance of 100 ohms. An inductance of 100 millihenrys at 14 megacycles is an inductive reactance of 9,000,000 ohms! One ampere of current, representing a real power of 100 watts into this resistor, would require that 9,000,000 volts be applied to the resistor. This example assumes that the inductive resistor had zero capacitive reactance, which is not possible, but the example does serve to illustrate why it is difficult to get power into an inductive resistor at these frequencies—unless a difficult tuning job is attempted.

## COMPOSITION RESISTORS

A simple equivalent circuit of a composition resistor is a capacitance C shunted by a resistor R where R is the d.c. resistance and C the total capacitance across the resistor. The equivalent circuit will not hold strictly true for all frequencies but it suffices for most generalizations.

At frequencies up to approximately 100 megacycles the inductance may be neglected (except for very low values of resistance). The total capacitance is also low, being less than one pF. (when considering composition resistors in the resistance range below 1,000 ohms). The effective capacitive reactance is high enough that it presents no problem.

In other words, composition resistors are good for use at radio frequencies. They will act as though they are a pure resistance—within limits. The main disadvantage of these units is that they are available only in low-wattage styles. This need not be too serious a drawback, as will be explained later.

## WIRE-WOUND RESISTORS

The simple equivalent circuit of a wire-wound resistor is a resistor R in series with an inductance shunted by a capacitance C. This will hold true in a general way for both inductive and non-inductive units, where R is the d.c. resistance, C the total capacitance, and L the total inductance. In the case of

non-inductive units, L is the residual inductance. However, because of such factors as skin effect and dielectric loss there will be some limiting frequency where this circuit is no longer valid.

As frequency is increased the inductive reactance increases proportionately and the capacitive reactance decreases proportionately. Both of these effects are undesirable. Regular wire-wound resistors cease to be resistors in the true sense of the word at frequencies slightly above the audio range.

For radio-frequency uses it is necessary to go to the so-called non-inductive resistors. These are manufactured in such a way that the inductance is kept at a minimum. One popular scheme is the Ayrton-Perry winding in which two layers of wire are wound in opposite directions. As an example of what may be accomplished, one manufacturer states the inductance of a wire-wound unit at 66 microhenrys and the inductance of an identical value non-inductive unit at 0.6 microhenrys.

Generally speaking, non-inductive wire-wound resistors are not as good for use at radio frequencies as composition resistors, but the wide-wound units are capable of dissipating a great deal more power, and by the proper choice of unit satisfactory operation may be obtained.

## POWER CONSIDERATIONS

Before discussing which resistor to use where, it might be well to consider power ratings. If you have a kilowatt transmitter, with an output of 750 watts, it might seem necessary to have a dummy load capable of dissipating this amount of power. However, this is not true because it is possible to use resistors (both the composition type and wire-wound type) at several times their rating.

Tests have been made to determine the amount of overload which may be placed on resistors, and the following conclusions may be drawn. A resistor, or resistors of the composition or wire-wound type, may be used at 300% overload if the overload is applied for not longer than one minute, and if a fifteen minute cooling-off period is allowed between successive on periods.

Inasmuch as most tests can be conducted in a sixty-second on period, there is no need to use resistors which are capable of dissipating the full amount of power. As a matter of fact, if it is desirable to use resistors for long test periods, it may be necessary to have a safety factor involved unless adequate ventilation is provided for the resistors. That is, for long test periods, you should use resistors capable of dissipating twice the power you apply to them.

## CHOOSING A RESISTOR

Now that we have a general idea of the power rating we may need, let's see what resistors we can use for various power levels.

For measurement or antenna matching work, where you usually use your v.f.o. or a grid-dip oscillator for a power source, half-watt composition

## ACCURATE FREQUENCY TRANSMISSIONS FROM VK3WI

The next Accurate Frequency Transmission will take place on Thursday evening, 28th Feb., 1952, on the 7 Mc. band. Details of the operating procedure and times of operation will be found on page 8 of the January, 1952, issue of this magazine.

# TWO WORTHWHILE ANTENNAE

BY G. M. BOWEN,\* VK5XU

## Three-Band Antenna

40, 20, AND 10 METRES

**Physical Dimensions.**—68 feet long, cut into two parts at 33 feet from one end, insulator inserted and a 300 ohm feed line connected, one lead to each part of the flat top.

### Electrical Dimensions.—

40 metres—4 wave length;  
Pattern—Figure of 8.  
20 metres—1 wave length;  
Pattern—Four lobes.  
10 metres—2 wave lengths;  
Pattern—Four lobes.

**Feed Line** is not symmetrical to earth and therefore should be linked to the final p.a. tank at a few turns away from the earth end of the tank for unbalanced finals or to one side of the earthed point in p.p. finals and symmetrical tank circuits.

**The Coupling Link** may require about one-third of the number of turns in the final tank coil, but this is all in order as 300 ohms is a high impedance for power tuning.

Retuning of final tank condenser should be negligible if the antenna has been cut to resonance.

**Antenna Tuning Units** may be inserted between the final tank and the feed line, but the tuner should be treated as outlined for the coupling to the final tank when coupling to the feeder. Experimenting with single or double turn low impedance links here (either earthed or not) will help reduce harmonic radiation.

The idea for the antenna was obtained from "Radio News and Television" and was originally for two bands only, but by accident and then by design, and the drawing of impedance curves and checking with a s.w. lamp indicator, VK5MD and I successfully used it on the three bands.

Since then many others have erected the antenna either using 300 ohm ribbon or open wire lines and all report worthwhile success for DX operation. The power does get into the antenna for a minimum of effort.

I believe now, that somebody else has erected a similar arrangement with double the dimensions so that four bands can be used—30, 20 and 10. Country Hams could possibly try this and report on it. My wife objects to erecting a pole in the front lawn!!

## Two-Band Antenna

50 AND 144 Mc.

Reading the May issue of "QST" "World Above 50 Mc." on page 48, I came across the information that the Oxford County of Amateur Radio Association was using a single co-axial antenna for 6 and 2 metre operation. Their antenna had the dimensions of 55' for both spike and skirt, thus working as a halfwave antenna on 50 Mc. and three halfwaves on 144 Mc.

\* 73 Portrush Rd., Toorak Gardens, S.A.

The idea appealed and already having a co-axial antenna for 2 metres with skirt and spike 18½' long, I decided that by adding 37 inches to the quarterwave spike I would obtain a full wave radiator without altering the characteristics for 2 metre operation.

Actually I pushed a 55½' length of 1" dural rod over the spike and bolted it securely by putting 1" Whitworth brass bolts (tapped holes) through both the 18½' and 55½' pieces of metal rod and tubing. The skirt remained unaltered.

On 2 metres no change in the coupling was required, indicating that the extra halfwave added had not altered the radiator electrically.

On 6 metres the coupling had to be reduced so that with an 8-turn final tank coil and a 1-turn coupling loop to the co-axial cable (75 ohm), the loop was only about quarter way in mesh. There was little retuning of the final necessary, indicating a close enough antenna resonance and a standing wave ratio which was low enough to be tolerated.

Theoretically, the skirt should have been lengthened to 55½' to make a perfect match on 6 metres, and I can answer all the objections to using the 18½' skirt, but the fact is it works and works well on both bands and my curiosity and pocket is well satisfied!

— — —

## HOW TO KILL AN ORGANISATION

These six points have circulated around the world for years and are still worth pasting in your book.

1. Don't come to meetings.
2. If you do attend a meeting, find fault with the officers, the other members, and the organisation's policy.
3. Never accept office because it is easier to criticise than to do things, but get sore if you are not appointed.
4. If asked by the Chairman to give an opinion on some important matter, tell him that you have nothing to say. After the meeting however tell everyone how you think things ought to be done.
5. Do nothing more than is absolutely necessary, but when other members roll up their sleeves and willingly use their ability to help matters along, then howl that the organisation is run by a clique.
6. Whatever you do don't bother to get any new members, always let the other fellow do that.

— — —

## FREQUENCY ALLOCATIONS

The following is a list of the bands available for use by the Amateur Service in Australia followed by the types of emission allowed on those bands.

3.5 to 3.8 Mc.	—A1, 2, 3a, 6F3.
7.0 to 7.3 Mc.	—A1, 3, 3a, 6F3.
14.0 to 14.4 Mc.	—A1, 2, 3a, 6F3.
26.8 to 27.25 Mc.	—A1, 3, F.M.
28.0 to 30.0 Mc.	—A1, 3, 3a, 6F3.
50.0 to 54.0 Mc.	—A1, 2, 3, F.M.
144 to 148 Mc.	—A1, 1, 2, 3, F.M., Pulse.
280 to 290 Mc.	—A1, 1, 2, 3, F.M., Pulse.
570 to 585 Mc.	—A1, 1, 2, 3, F.M., Pulse.
1215 to 1300 Mc.	—A1, 1, 2, 3, F.M., Pulse.
2300 to 2450 Mc.	—A1, 1, 2, 3, F.M., Pulse.
3650 to 3850 Mc.	—A1, 1, 2, 3, F.M., Pulse.
10000 to 10000 Mc.	—A1, 1, 2, 3, F.M., Pulse.
21000 to 23000 Mc.	—A1, 1, 2, 3, F.M., Pulse.
30000 Mc. and higher.	—A1, 1, 2, 3, F.M., Pulse.

resistors are adequate, power-wise. For impedance values of 50, 75 or 100 ohms single unit ½ watt resistors are good up through 150 megacycles. For 300 ohm work, a single 300 ohm resistor is not satisfactory, as the effective capacitive reactance starts to show up at 100 megacycles. However, two 150 ohm ½ watt resistors in series are satisfactory up to 150 megacycles.

No tests were made on resistors of more than 300 ohms resistance, but it is obvious that the capacitive reactance will be a factor to be considered, so that higher and higher values of resistance will be "pure resistance" only for lower and lower frequencies.

Dummy loads capable of handling sixty watts (the output of a 100 watt input transmitter) can be made by employing 2 watt composition resistors. Ten 2 watt resistors will dissipate twenty watts, which, with our factor of three employed, allow their use as 60 watt loads. Obviously, these resistors can be placed either in series or in parallel, but tests indicate that it is desirable to make these loads as follows:

For a 50 ohm load, use ten 500 ohm resistors in parallel. For a 75 ohm load, use ten 750 ohm resistors in parallel. For a 300 ohm load, use ten 30 ohm resistors in series. All of these combinations give good results as dummy loads up to 150 megacycles.

The proper way to parallel resistors is to make two circular discs of copper or brass, and drill ten holes, equally spaced, around the edge of each disc. Mount the resistors between the discs and solder each lead to the disc. If desired, a coaxial fitting may be mounted, or broad straps may be soldered to the two discs.

If you use a 300 ohm load, the resistors should be in series. The best way to do this is to make two sets of five resistors, each set in a straight line, then connect one end of the two sets together. This brings the two leads of the composite resistor adjacent to each other. All leads in the series string should be as short as possible.

Dummy loads capable of handling 300 watts can be made from ten 10-watt non-inductive resistors. For a 50 ohm load, use ten 500 ohm resistors in parallel. For a 75 ohm load use ten 750 ohm resistors in parallel. For a 300 ohm load, use ten 3,000 ohm resistors in parallel. All these combinations are usable to 150 megacycles if the units are paralleled as described before.

## USING A DUMMY LOAD

There are a few precautions to be observed when connecting a dummy load to a source of power. One, make as direct a connection as possible, and use low inductance leads, such as copper straps.

Two, keep the dummy load away from metallic objects, in order to avoid an unbalance to ground.

Three, keep the dummy load well in the clear so that adequate air circulation is assured.

The information just given on non-inductive resistors is intended as a general guide to the selection of such resistors. Rigorous and complete tests are quite difficult to make, especially when a large variety of resistors is considered. —"Lighthouse Larry," Jan.-Feb., 1951, "Ham News."

## THE QQE06/40

QUITE considerable interest has been shown in the new Philips double tetrode, the QQE06/40, and the object of writing this article is to supply a few more details than are generally known about this tube.

Firstly, the filaments can be operated from either 6.3 volts at 1.8 amp. or 12.6 volts at 0.9 amp.; the cathode, which is indirectly heated, is common to both tetrodes; more will be said about this later.

The d.c. anode voltage is 600 volts maximum at frequencies below 250 Mc., 400 volts maximum at frequencies above 300 Mc. and maximum of 500 volts in the intermediate frequency range; the screen grid voltage is 250 volts.

The dissipation of each anode may amount to 20 w. and that of the screen grid is 7 w., so that in a well-designed rig the plate input can be 68 w. on phone or 100 w. or more on c.w.



If you take a look at the drawing of the horizontal cross-section (Fig. 1), you will see that the screen grid (G2) is, like the cathode, common to both sections. This screen grid is made of windings fixed to two supporting rods. This construction avoids the necessity of separate leads for the two halves, and thus also completely eliminates the self-induction of these leads.

Since the beam-plates prevent them from following long trajectories, all the electrons have about the same and the shortest possible transit time. Without such a measure there would be a difference in transit time, and at very high frequencies these differences would adversely affect the efficiency of the valve.

Reverting to the cathode, if you look again at Fig. 1 you will see that this is in the form of a roughly rectangular tube. Only the long, slightly convex sides of this tube are coated with an emitting material, so that really the tube has two cathodes interconnected by the shorter sides of the rectangular body. The self-induction of these short and wide "connecting strips" connected in parallel is so small that even at frequencies of 400 Mc. the effect of self-induction in the cathode interconnections is quite negligible.

The resistance of this connection is likewise very small, even at high frequencies, due partly to the fact that the working temperature of the cathode lies above the Curie point of nickel, so that permeability is 1, and consequently there is but little skin effect. The two control grids are curved so that when they expand the distance between the grid and cathode is not reduced, and thus there is no risk of short-circuiting.

These control grids are made of molybdenum wire plated with a layer

of gold. This plating reduces the resistance at high frequencies, and minimises the risk of thermionic emission from the grid.

An outstanding property of this tube is its inability to oscillate unless feedback is purposely applied externally.

This very desirable effect is brought about by virtue of the fact that it has its own neutralising capacitors actually built in. These are in the form of a short wire welded on to the extended support of each control grid and extended adjacent to the opposite anode. The capacitance is practically equal to that between an anode and its corresponding control grid. In this way, a neutralisation is obtained which is entirely independent of the frequency at which the tube is working.

The tube as a whole is very rugged, the glass envelope is made of hard glass which is able to stand high temperatures. The anodes protrude from the top of this, all the other electrodes being connected to seven rods of molybdenum which are fused into a base of "Sintered" glass.

There is no doubt that this tube is really good and ideal for the Amateur; it has an efficiency of 72% on a wavelength of 5 metres, and above that probably has still even greater efficiency.

Just in passing, I will mention the fact that this tube is widely publicised in America, where the type number is AX9903, which is the same tube and manufactured in Holland.

[The above article is reprinted from "Radio ZS," May, 1951.]

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- \* American Hewlett-Packard 55-400 Mc. V.H.F. Wavemeters (few only available) £6/10/-
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# Clamper Tube Controlled Carrier for Screen Grid Finals

Controlled carrier is, of course, no new thing. In the past many methods have been devised to effectively control the carrier via the audio intensity with varying success. These methods ranged from voice-operated relays to "class B electronic control," each seeming to have some snag or other, making it unsuitable for Ham work.

Quite recently, however, a good system became available to Hams (April "QST"), but it is specifically of the screen modulator variety which, it is felt, has no ready appeal to Hams. We generally realise that a 50 watt plate modulator, with its attendant higher efficiency, isn't a huge order (and more than sufficient for the full licence requirements of 100 watts).

It was thought necessary, therefore, to develop a method of carrier control suitable for plate modulated finals preferably of the tetrode variety, as this seems the more popular these days. The "clamper" tube effectively controls the screen volts of a tetrode final by means of audio-derived excitation.

The advantages of controlled carrier are well worth while provided the method of achieving it isn't complex; briefly, these advantages are:—

- (a) Economy of tube life and power.
- (b) Virtually full modulation for any audio level.
- (c) Ability to exceed ratings with some justification.
- (d) Reduction in heterodyne interferences.

The method finally arrived at has all these advantages and more; it is cheap, simple, foolproof with no fussy adjustments for guaranteed success. One has only to build it as a separate little unit and tie it to the existing rig via a short cable.

It uses the "clamper" tube principle, but instead of letting the clamper receive its negative grid supply from class C bias, we now use rectified audio in a similar manner so that when no audio exists the clamper holds the screen voltage of the final amplifier well down, and low r.f. output results. The moment audio enters the mike, the clamper draws less current through the final's screen-dropping resistor and the screen voltage rises, r.f. output rising in unison.

A variable sensitivity control is provided (an ordinary volume control with switch) to cut out carrier control for tuning transmitter and loading. Maximum control approx. minus 18 db.

More control than this figure is not possible with the scheme—nor is it really desirable. Recent experiments at ZS2LT have shown that circuit noise, hum and general room noises can finally modulate a carrier when this carrier is reduced by 20 db or so. This gives rise to the disconcerting effect of speech-noise, when received under a.v.c. conditions at the far end, hence it is not truly advantageous to have greater control than this, without changes in receiving technique.

Briefly following the circuit, we tap off some audio from the plate of the second speech amplifier; this audio is fed via the sensitivity control to the 6R7, whose plate circuit feeds an ordinary "plate to push-pull grids" transformer. The secondary winding feeds the diodes of the 6R7, and the centre tap provides negative d.c. to the grid of the 6Y6 (or 6L6) clamper tube.

The plate and screen of the 6Y6 are commoned and connected directly to the screen of the r.f. final amplifier (this screen being conventionally fed via a suitable dropping resistor to the modulated h.t. supply).

It will be noticed that the diode returns to the cathode of the 6R7 in order that the grid of the 6Y6 be slightly positive for the silences, thereby taking advantage of the heavier drain (more effective "hold down" of the r.f. final's screen volts) that the 6Y6 causes this way.

In speech type audio a tremendous proportion of transmission time is actually silent; these silences are "cool-off" or rest periods for the final when the carrier is controlled—this ensures a long and useful life (813s are no longer a few bob each).

A comparative test revealed that an 815 at 75 watts input with controlled carrier runs appreciably cooler than it normally does at 50 watts without control.

There are no snags to the construction or operation of the unit, and the few shillings spent on it is well worth while—you probably have it all in the junk box, anyway.

Operating is simple; one merely advances the sensitivity control sufficiently

until a normal voice power kicks the plate meter from a low reading to its usual reading.

So much interest has been provided by this high-efficiency gadget, and since the thing performs extremely well, it is heartily recommended to the many 807s and 813s, etc., final amplifier users of our Ham fraternity.

[Note from Technical Editor. It should be realised that as the clamper tube is controlled exclusively by audio there is no protection to the final in the event of loss of excitation. This protection may be provided by other means, such as an excitation-controlled clamper tube, should it be necessary.]

—By ZS2LT, reprinted from "Radio ZS," May, 1951.

## Low Drift Crystals FOR AMATEUR BANDS

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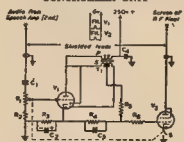
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- C3—0.25 uF. paper.
- C4—0.5 uF. or better (600 v.).
- R1—1 meg. volume control with switch.
- R2—15,000 ohm (½ watt).
- R3—1,000 ohm (2 watts).
- R4—0.25 meg. (½ watt).
- R5—5,000 ohm (½ watt).
- R6—50,000 ohm (½ watt).
- T1—Plate to p.p. grids transformer.
- V1—6R7.
- V2—6Y6 (or 6L6).



# FIFTY MEGACYCLES AND ABOVE

Compiled by J. K. RIDGWAY, VK3CR.

## NEW SOUTH WALES

**50 Mc. News:** The Ross Hill Contest got away to a good start with the 50 Mc. band in fine fettle. This year has shown a return to the conditions prevailing some years ago when the band being open Interstate for long periods, sometimes for the whole day.

Outstanding amongst the breaks have been those when Ken Gailard was signposting in the like locals for hours at a time. Even those who normally are unable to work ZL unless signals are very strong, have been making many contacts and a deal of listening.

It has now been learned that the first VK1 to be worked by VK3CRK was VK3U1 at 1400 hours. Russ and Alan contacted on December 1st at 1830 on c.w. and again at 1940 on phone. Another contact was made at 2145 with JUI on phone and 5XKK on c.w. Signals varied 5.4-5.9ZP also worked 5XK on phone at 1855-2000 hours. Russ has been very much soured after since these contacts were made, but to date the only VK1s to be made grade have been 2WJ and 2WV. The ZLs have been heard working VK3CRK practically every time the band opened to VK1. So far the stations from which he has been heard in Sydney, in fact some begin to doubt whether they are really active at all.

Contacts with VKs have been very much more frequent this year than for some time and during the last few days of 1961 the band was open for more than 10 hours.

At time of writing the band is open to VKs with 2AG working 4NG. Leo has been popping up on a few days of late and collecting some of the DX. 2ABC has been very active during the contest and has a pretty large score. Fred insists that he isn't taking the contest seriously and that he is only making calls to DX almost any time one turns on a RX.

2BC and his brother 2BD should enter into the VKs notes this month as they must surely have more powerful signals in Sydney than they have in VKs, they just couldn't be any stronger! The QRM position on the lowest 100 kc. of the band felt worse. 2SL has been working along with 2AH, 2ABC, 2VW and 2JX so that during a DX opening one may as well skip the band as far as the DX matters are concerned. One VKs remarked to 2ANT that the latter's frequency high up in the band was quite a good one well clear of the QRM. The frequency in question is 50.3M! Upon being told that there were stations operating up to 51 Mc. in VKs the said VKs went off to tune what he termed "the high frequency end of the band."

2HO has been having many troubles with his RX which is still trying to cure try some D.D.T. Roy 2GZ, who shortly travels northwards, has been amongst the DX, his holidays happily coinciding with the DX season. 2WV has a special private tunnel through which the ZLs just "pour in" and John has been making hay while the ZLs shine. How many ZLs have you worked this year John?

In the country districts there has been much activity. 2VH has been chasing them up followed by his near neighbour 2AMV. During the DX season 2VH has been opening 25 stations in Sydney and to judge by the number of stations calling him, 2AMV of Dubbo must be doing very well. During this period 2VH's active near neighbour 2AJZ is silent, being away on holidays on the North Coast. What a feast you have missed Jack!

**144 Mc. News:** On the 15th December, at 1630, 2AH made his first two-way contact with 2AG on 144 Mc. His contact with ZL3AR lasted for some seven minutes at 87 both ways. At the same time, 50 Mc. was wide open and 2AH was busy for some hours, the 144 Mc. contact being made during what appears to have been the peak of the 50 Mc. opening. 2AH was using 100 watts to an 82 and a 25 element beam.

Alan was heard by two stations in ZL and a number of the Sydney chaps heard the ZL. The contact has created wide interest and at 144 Mc. contacts when the band opened to ZLs have been made. Alan has been able to hand that ZL3AR was using 250 watts to a pair of 82s and a fairly large array. It would seem possible that 2AG would get a high gain beam is necessary for the best result.

On 16th December 2GU and 2ANF made the first Sydney to Canberra contact on 144 Mc. Signals were 5.3 from Sydney and 5.4 from Canberra. 2MQ followed in and a second contact was made 2GU with 2ANF 70 watts to an 82B and a 25 element beam. 2ANF 18 watts to an 82 and a three over three, and 2MQ 100 watts to 2GU with a 15 element beam. Since then 2GU has not been heard and there is at the moment no news as to whether he is still active on 144 Mc.

The same evening a few minutes after the Canberra contact, 2MQ made the first Sydney-Muswellbrook contact with 2ANU with signals being 5.2. A number of other Sydney stations also made the contact with Ken who is running fairly low power from a 25v. house lighting set. A few days later conditions being kind once again, 2ANU made quite a number of contacts including 2ID who was still using a dipole between the roof and ceiling! Albert has a beautiful log of the north but nobody thought he would be able to work as far as 2ANU with his buried antenna!

On the 21st, 2JW went portable with 144 gear on the top of Mt. Canadine near Oran Park. He made contact with 2ANT. Norm also heard a number of other Sydney stations at good strength but was unable to raise them. The TX he intended using refused to raise them. He went back to the small job running 2 1/2 watts' later in the month Norm made a second trip but still couldn't raise the TX. The TX in question has now cleared up the troubles and has sufficient grid drive so the next trip should be a great success.

2NS has his new 82B TX going and puts in a good signal to the Sydney area using about 70 watts. 2VH has made two-way contact with 2AH using 2VH's 82B TX and 2AH's 250 watts which fills the gap in his 3 m. gear. 2VH threatens to excite his 82B and should be quite a fair match for the 2AH's 250 watts.

In Sydney, 2AGS is a new station. Alec, who is located at Newtown, is using an 82B final, xtal controlled and putting out a very good signal. 2AGS has been working 2AG on 144 Mc. and moved to the low end of the band. 144.5 to quote Jim—the frequency, however, is almost spot on 144.0 in the country zone! The band has been very quiet, the only station not observing the gentlemen's agreement is 2XG who still remains on approx. 144.6 KCR and 2CA have not been very active of late but Cec has been able to make contact with 2ABZ much to Bill's delight.

**80 Mc. News:** Very little to report on activities on this band. 2VR has shown up complete with ASB7 RX which from reports comes up to expectations. 2XK also has his ASB7 RX going and has been using it up to 80 Mc. of same. 2AJZ has been getting adverse signal reports of late but has been too busy with xtal controlled converters for 144 Mc. to do anything about it—VK3ANF.

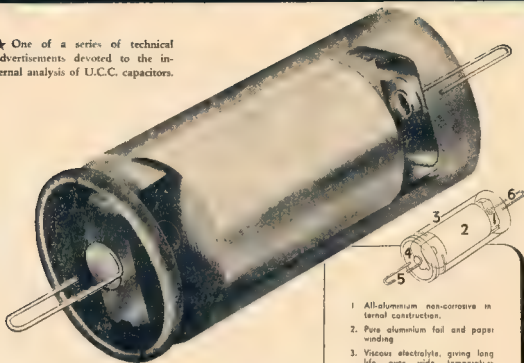
## QUEENSLAND

Dates to remember: February 16, Field Day No. 8; and February 19, the Group meeting.

The following Melbourne stations are expected to be operating from portable locations: 2ABA, 2FO, 2GZ, 2H, 2J, 2K, 2L, 2M, 2N, 2O, 2P, 2Q, 2R, 2S, 2T, 2U, 2V, 2W, 2X, 2Y, 2Z, 2AA, 2AB, 2AC, 2AD, 2AE, 2AF, 2AG, 2AH, 2AI, 2AJ, 2AK, 2AL, 2AM, 2AN, 2AO, 2AP, 2AQ, 2AR, 2AS, 2AT, 2AU, 2AV, 2AW, 2AX, 2AY, 2AZ, 2BA, 2BB, 2BC, 2BD, 2BE, 2BF, 2BG, 2BH, 2BI, 2BJ, 2BK, 2BL, 2BM, 2BN, 2BO, 2BP, 2BQ, 2BR, 2BS, 2BT, 2BU, 2BV, 2BW, 2BX, 2BY, 2BZ, 2CA, 2CB, 2CC, 2CD, 2CE, 2CF, 2CG, 2CH, 2CI, 2CJ, 2CK, 2CL, 2CM, 2CN, 2CO, 2CP, 2CQ, 2CR, 2CS, 2CT, 2CU, 2CV, 2CW, 2CX, 2CY, 2CZ, 2DA, 2DB, 2DC, 2DD, 2DE, 2DF, 2DG, 2DH, 2DI, 2DJ, 2DK, 2DL, 2DM, 2DN, 2DO, 2DP, 2DQ, 2DR, 2DS, 2DT, 2DU, 2DV, 2DW, 2DX, 2DY, 2DZ, 2EA, 2EB, 2EC, 2ED, 2EE, 2EF, 2EG, 2EH, 2EI, 2EJ, 2EK, 2EL, 2EM, 2EN, 2EO, 2EP, 2EQ, 2ER, 2ES, 2ET, 2EU, 2EV, 2EW, 2EX, 2EY, 2EZ, 2FA, 2FB, 2FC, 2FD, 2FE, 2FF, 2FG, 2FH, 2FI, 2FJ, 2FK, 2FL, 2FM, 2FN, 2FO, 2FP, 2FQ, 2FR, 2FS, 2FT, 2FU, 2FV, 2FW, 2FX, 2FY, 2FZ, 2GA, 2GB, 2GC, 2GD, 2GE, 2GF, 2GG, 2GH, 2GI, 2GJ, 2GK, 2GL, 2GM, 2GN, 2GO, 2GP, 2GQ, 2GR, 2GS, 2GT, 2GU, 2GV, 2GW, 2GX, 2GY, 2GZ, 2HA, 2HB, 2HC, 2HD, 2HE, 2HF, 2HG, 2HH, 2HI, 2HJ, 2HK, 2HL, 2HM, 2HN, 2HO, 2HP, 2HQ, 2HR, 2HS, 2HT, 2HU, 2HV, 2HW, 2HX, 2HY, 2HZ, 2IA, 2IB, 2IC, 2ID, 2IE, 2IF, 2IG, 2IH, 2II, 2IJ, 2IK, 2IL, 2IM, 2IN, 2IO, 2IP, 2IQ, 2IR, 2IS, 2IT, 2IU, 2IV, 2IW, 2IX, 2IY, 2IZ, 2JA, 2JB, 2JC, 2JD, 2JE, 2JF, 2JG, 2JH, 2JI, 2JJ, 2JK, 2JL, 2JM, 2JN, 2JO, 2JP, 2JQ, 2JR, 2JS, 2JT, 2JU, 2JV, 2JW, 2JX, 2JY, 2JZ, 2KA, 2KB, 2KC, 2KD, 2KE, 2KF, 2KG, 2KH, 2KI, 2KJ, 2KL, 2KM, 2KN, 2KO, 2KP, 2KQ, 2KR, 2KS, 2KT, 2KU, 2KV, 2KW, 2KX, 2KY, 2KZ, 2LA, 2LB, 2LC, 2LD, 2LE, 2LF, 2LG, 2LH, 2LI, 2LJ, 2LK, 2LL, 2LM, 2LN, 2LO, 2LP, 2LQ, 2LR, 2LS, 2LT, 2LU, 2LV, 2LW, 2LX, 2LY, 2LZ, 2MA, 2MB, 2MC, 2MD, 2ME, 2MF, 2MG, 2MH, 2MI, 2MJ, 2MK, 2ML, 2MN, 2MO, 2MP, 2MQ, 2MR, 2MS, 2MT, 2MU, 2MV, 2MW, 2MX, 2MY, 2MZ, 2NA, 2NB, 2NC, 2ND, 2NE, 2NF, 2NG, 2NH, 2NI, 2NJ, 2NK, 2NL, 2NM, 2NN, 2NO, 2NP, 2NQ, 2NR, 2NS, 2NT, 2NU, 2NV, 2NW, 2NX, 2NY, 2NZ, 2OA, 2OB, 2OC, 2OD, 2OE, 2OF, 2OG, 2OH, 2OI, 2OJ, 2OK, 2OL, 2OM, 2ON, 2OO, 2OP, 2OQ, 2OR, 2OS, 2OT, 2OU, 2OV, 2OW, 2OX, 2OY, 2OZ, 2PA, 2PB, 2PC, 2PD, 2PE, 2PF, 2PG, 2PH, 2PI, 2PJ, 2PK, 2PL, 2PM, 2PN, 2PO, 2PP, 2PQ, 2PR, 2PS, 2PT, 2PU, 2PV, 2PW, 2PX, 2PY, 2PZ, 2QA, 2QB, 2QC, 2QD, 2QE, 2QF, 2QG, 2QH, 2QI, 2QJ, 2QK, 2QL, 2QM, 2QN, 2QO, 2QP, 2QQ, 2QR, 2QS, 2QT, 2QU, 2QV, 2QW, 2QX, 2QY, 2QZ, 2RA, 2RB, 2RC, 2RD, 2RE, 2RF, 2RG, 2RH, 2RI, 2RJ, 2RK, 2RL, 2RM, 2RN, 2RO, 2RP, 2RQ, 2RR, 2RS, 2RT, 2RU, 2RV, 2RW, 2RX, 2RY, 2RZ, 2SA, 2SB, 2SC, 2SD, 2SE, 2SF, 2SG, 2SH, 2SI, 2SJ, 2SK, 2SL, 2SM, 2SN, 2SO, 2SP, 2SQ, 2SR, 2SS, 2ST, 2SU, 2SV, 2SW, 2SX, 2SY, 2SZ, 2TA, 2TB, 2TC, 2TD, 2TE, 2TF, 2TG, 2TH, 2TI, 2TJ, 2TK, 2TL, 2TM, 2TN, 2TO, 2TP, 2TQ, 2TR, 2TS, 2TT, 2TU, 2TV, 2TW, 2TX, 2TY, 2TZ, 2UA, 2UB, 2UC, 2UD, 2UE, 2UF, 2UG, 2UH, 2UI, 2UJ, 2UK, 2UL, 2UM, 2UN, 2UO, 2UP, 2UQ, 2UR, 2US, 2UT, 2UU, 2UV, 2UW, 2UX, 2UY, 2UZ, 2VA, 2VB, 2VC, 2VD, 2VE, 2VF, 2VG, 2VH, 2VI, 2VJ, 2VK, 2VL, 2VM, 2VN, 2VO, 2VP, 2VQ, 2VR, 2VS, 2VT, 2VU, 2VV, 2VW, 2VX, 2VY, 2VZ, 2WA, 2WB, 2WC, 2WD, 2WE, 2WF, 2WG, 2WH, 2WI, 2WJ, 2WK, 2WL, 2WM, 2WN, 2WO, 2WP, 2WQ, 2WR, 2WS, 2WT, 2WU, 2WV, 2WW, 2WX, 2WY, 2WZ, 2XA, 2XB, 2XC, 2XD, 2XE, 2XF, 2XG, 2XH, 2XI, 2XJ, 2XK, 2XL, 2XM, 2XN, 2XO, 2XP, 2XQ, 2XR, 2XS, 2XT, 2XU, 2XV, 2XW, 2XX, 2XY, 2XZ, 2YA, 2YB, 2YC, 2YD, 2YE, 2YF, 2YG, 2YH, 2YI, 2YJ, 2YK, 2YL, 2YM, 2YN, 2YO, 2YP, 2YQ, 2YR, 2YS, 2YT, 2YU, 2YV, 2YW, 2YX, 2YY, 2YZ, 2ZA, 2ZB, 2ZC, 2ZD, 2ZE, 2ZF, 2ZG, 2ZH, 2ZI, 2ZJ, 2ZK, 2ZL, 2ZM, 2ZN, 2ZO, 2ZP, 2ZQ, 2ZR, 2ZS, 2ZT, 2ZU, 2ZV, 2ZW, 2ZX, 2ZY, 2ZZ, 2AA, 2AB, 2AC, 2AD, 2AE, 2AF, 2AG, 2AH, 2AI, 2AJ, 2AK, 2AL, 2AM, 2AN, 2AO, 2AP, 2AQ, 2AR, 2AS, 2AT, 2AU, 2AV, 2AW, 2AX, 2AY, 2AZ, 2BA, 2BB, 2BC, 2BD, 2BE, 2BF, 2BG, 2BH, 2BI, 2BJ, 2BK, 2BL, 2BM, 2BN, 2BO, 2BP, 2BQ, 2BR, 2BS, 2BT, 2BU, 2BV, 2BW, 2BX, 2BY, 2BZ, 2CA, 2CB, 2CC, 2CD, 2CE, 2CF, 2CG, 2CH, 2CI, 2CJ, 2CK, 2CL, 2CM, 2CN, 2CO, 2CP, 2CQ, 2CR, 2CS, 2CT, 2CU, 2CV, 2CW, 2CX, 2CY, 2CZ, 2DA, 2DB, 2DC, 2DD, 2DE, 2DF, 2DG, 2DH, 2DI, 2DJ, 2DK, 2DL, 2DM, 2DN, 2DO, 2DP, 2DQ, 2DR, 2DS, 2DT, 2DU, 2DV, 2DW, 2DX, 2DY, 2DZ, 2EA, 2EB, 2EC, 2ED, 2EE, 2EF, 2EG, 2EH, 2EI, 2EJ, 2EK, 2EL, 2EM, 2EN, 2EO, 2EP, 2EQ, 2ER, 2ES, 2ET, 2EU, 2EV, 2EW, 2EX, 2EY, 2EZ, 2FA, 2FB, 2FC, 2FD, 2FE, 2FF, 2FG, 2FH, 2FI, 2FJ, 2FK, 2FL, 2FM, 2FN, 2FO, 2FP, 2FQ, 2FR, 2FS, 2FT, 2FU, 2FV, 2FW, 2FX, 2FY, 2FZ, 2GA, 2GB, 2GC, 2GD, 2GE, 2GF, 2GG, 2GH, 2GI, 2GJ, 2GK, 2GL, 2GM, 2GN, 2GO, 2GP, 2GQ, 2GR, 2GS, 2GT, 2GU, 2GV, 2GW, 2GX, 2GY, 2GZ, 2HA, 2HB, 2HC, 2HD, 2HE, 2HF, 2HG, 2HH, 2HI, 2HJ, 2HK, 2HL, 2HM, 2HN, 2HO, 2HP, 2HQ, 2HR, 2HS, 2HT, 2HU, 2HV, 2HW, 2HX, 2HY, 2HZ, 2IA, 2IB, 2IC, 2ID, 2IE, 2IF, 2IG, 2IH, 2II, 2IJ, 2IK, 2IL, 2IM, 2IN, 2IO, 2IP, 2IQ, 2IR, 2IS, 2IT, 2IU, 2IV, 2IW, 2IX, 2IY, 2IZ, 2JA, 2JB, 2JC, 2JD, 2JE, 2JF, 2JG, 2JH, 2JI, 2JJ, 2JK, 2JL, 2JM, 2JN, 2JO, 2JP, 2JQ, 2JR, 2JS, 2JT, 2JU, 2JV, 2JW, 2JX, 2JY, 2JZ, 2KA, 2KB, 2KC, 2KD, 2KE, 2KF, 2KG, 2KH, 2KI, 2KJ, 2KL, 2KM, 2KN, 2KO, 2KP, 2KQ, 2KR, 2KS, 2KT, 2KU, 2KV, 2KW, 2KX, 2KY, 2KZ, 2LA, 2LB, 2LC, 2LD, 2LE, 2LF, 2LG, 2LH, 2LI, 2LJ, 2LK, 2LM, 2LN, 2LO, 2LP, 2LQ, 2LR, 2LS, 2LT, 2LU, 2LV, 2LW, 2LX, 2LY, 2LZ, 2MA, 2MB, 2MC, 2MD, 2ME, 2MF, 2MG, 2MH, 2MI, 2MJ, 2MK, 2ML, 2MN, 2MO, 2MP, 2MQ, 2MR, 2MS, 2MT, 2MU, 2MV, 2MW, 2MX, 2MY, 2MZ, 2NA, 2NB, 2NC, 2ND, 2NE, 2NF, 2NG, 2NH, 2NI, 2NJ, 2NK, 2NL, 2NM, 2NN, 2NO, 2NP, 2NQ, 2NR, 2NS, 2NT, 2NU, 2NV, 2NW, 2NX, 2NY, 2NZ, 2OA, 2OB, 2OC, 2OD, 2OE, 2OF, 2OG, 2OH, 2OI, 2OJ, 2OK, 2OL, 2OM, 2ON, 2OO, 2OP, 2OQ, 2OR, 2OS, 2OT, 2OU, 2OV, 2OW, 2OX, 2OY, 2OZ, 2PA, 2PB, 2PC, 2PD, 2PE, 2PF, 2PG, 2PH, 2PI, 2PJ, 2PK, 2PL, 2PM, 2PN, 2PO, 2PP, 2PQ, 2PR, 2PS, 2PT, 2PU, 2PV, 2PW, 2PX, 2PY, 2PZ, 2QA, 2QB, 2QC, 2QD, 2QE, 2QF, 2QG, 2QH, 2QI, 2QJ, 2QK, 2QL, 2QM, 2QN, 2QO, 2QP, 2QQ, 2QR, 2QS, 2QT, 2QU, 2QV, 2QW, 2QX, 2QY, 2QZ, 2RA, 2RB, 2RC, 2RD, 2RE, 2RF, 2RG, 2RH, 2RI, 2RJ, 2RK, 2RL, 2RM, 2RN, 2RO, 2RP, 2RQ, 2RR, 2RS, 2RT, 2RU, 2RV, 2RW, 2RX, 2RY, 2RZ, 2SA, 2SB, 2SC, 2SD, 2SE, 2SF, 2SG, 2SH, 2SI, 2SJ, 2SK, 2SL, 2SM, 2SN, 2SO, 2SP, 2SQ, 2SR, 2SS, 2ST, 2SU, 2SV, 2SW, 2SX, 2SY, 2SZ, 2TA, 2TB, 2TC, 2TD, 2TE, 2TF, 2TG, 2TH, 2TI, 2TJ, 2TK, 2TL, 2TM, 2TN, 2TO, 2TP, 2TQ, 2TR, 2TS, 2TT, 2TU, 2TV, 2TW, 2TX, 2TY, 2TZ, 2UA, 2UB, 2UC, 2UD, 2UE, 2UF, 2UG, 2UH, 2UI, 2UJ, 2UK, 2UL, 2UM, 2UN, 2UO, 2UP, 2UQ, 2UR, 2US, 2UT, 2UU, 2UV, 2UW, 2UX, 2UY, 2UZ, 2VA, 2VB, 2VC, 2VD, 2VE, 2VF, 2VG, 2VH, 2VI, 2VJ, 2VK, 2VL, 2VM, 2VN, 2VO, 2VP, 2VQ, 2VR, 2VS, 2VT, 2VU, 2VV, 2VW, 2VX, 2VY, 2VZ, 2WA, 2WB, 2WC, 2WD, 2WE, 2WF, 2WG, 2WH, 2WI, 2WJ, 2WK, 2WL, 2WM, 2WN, 2WO, 2WP, 2WQ, 2WR, 2WS, 2WT, 2WU, 2WV, 2WW, 2WX, 2WY, 2WZ, 2XA, 2XB, 2XC, 2XD, 2XE, 2XF, 2XG, 2XH, 2XI, 2XJ, 2XK, 2XL, 2XM, 2XN, 2XO, 2XP, 2XQ, 2XR, 2XS, 2XT, 2XU, 2XV, 2XW, 2XX, 2XY, 2XZ, 2YA, 2YB, 2YC, 2YD, 2YE, 2YF, 2YG, 2YH, 2YI, 2YJ, 2YK, 2YL, 2YM, 2YN, 2YO, 2YP, 2YQ, 2YR, 2YS, 2YT, 2YU, 2YV, 2YW, 2YX, 2YY, 2YZ, 2ZA, 2ZB, 2ZC, 2ZD, 2ZE, 2ZF, 2ZG, 2ZH, 2ZI, 2ZJ, 2ZK, 2ZL, 2ZM, 2ZN, 2ZO, 2ZP, 2ZQ, 2ZR, 2ZS, 2ZT, 2ZU, 2ZV, 2ZW, 2ZX, 2ZY, 2ZZ, 2AA, 2AB, 2AC, 2AD, 2AE, 2AF, 2AG, 2AH, 2AI, 2AJ, 2AK, 2AL, 2AM, 2AN, 2AO, 2AP, 2AQ, 2AR, 2AS, 2AT, 2AU, 2AV, 2AW, 2AX, 2AY, 2AZ, 2BA, 2BB, 2BC, 2BD, 2BE, 2BF, 2BG, 2BH, 2BI, 2BJ, 2BK, 2BL, 2BM, 2BN, 2BO, 2BP, 2BQ, 2BR, 2BS, 2BT, 2BU, 2BV, 2BW, 2BX, 2BY, 2BZ, 2CA, 2CB, 2CC, 2CD, 2CE, 2CF, 2CG, 2CH, 2CI, 2CJ, 2CK, 2CL, 2CM, 2CN, 2CO, 2CP, 2CQ, 2CR, 2CS, 2CT, 2CU, 2CV, 2CW, 2CX, 2CY, 2CZ, 2DA, 2DB, 2DC, 2DD, 2DE, 2DF, 2DG, 2DH, 2DI, 2DJ, 2DK, 2DL, 2DM, 2DN, 2DO, 2DP, 2DQ, 2DR, 2DS, 2DT, 2DU, 2DV, 2DW, 2DX, 2DY, 2DZ, 2EA, 2EB, 2EC, 2ED, 2EE, 2EF, 2EG, 2EH, 2EI, 2EJ, 2EK, 2EL, 2EM, 2EN, 2EO, 2EP, 2EQ, 2ER, 2ES, 2ET, 2EU, 2EV, 2EW, 2EX, 2EY, 2EZ, 2FA, 2FB, 2FC, 2FD, 2FE, 2FF, 2FG, 2FH, 2FI, 2FJ, 2FK, 2FL, 2FM, 2FN, 2FO, 2FP, 2FQ, 2FR, 2FS, 2FT, 2FU, 2FV, 2FW, 2FX, 2FY, 2FZ, 2GA, 2GB, 2GC, 2GD, 2GE, 2GF, 2GG, 2GH, 2GI, 2GJ, 2GK, 2GL, 2GM, 2GN, 2GO, 2GP, 2GQ, 2GR, 2GS, 2GT, 2GU, 2GV, 2GW, 2GX, 2GY, 2GZ, 2HA, 2HB, 2HC, 2HD, 2HE, 2HF, 2HG, 2HH, 2HI, 2HJ, 2HK, 2HL, 2HM, 2HN, 2HO, 2HP, 2HQ, 2HR, 2HS, 2HT, 2HU, 2HV, 2HW, 2HX, 2HY, 2HZ, 2IA, 2IB, 2IC, 2ID, 2IE, 2IF, 2IG, 2IH, 2II, 2IJ, 2IK, 2IL, 2IM, 2IN, 2IO, 2IP, 2IQ, 2IR, 2IS, 2IT, 2IU, 2IV, 2IW, 2IX, 2IY, 2IZ, 2JA, 2JB, 2JC, 2JD, 2JE, 2JF, 2JG, 2JH, 2JI, 2JJ, 2JK, 2JL, 2JM, 2JN, 2JO, 2JP, 2JQ, 2JR, 2JS, 2JT, 2JU, 2JV, 2JW, 2JX, 2JY, 2JZ, 2KA, 2KB, 2KC, 2KD, 2KE, 2KF, 2KG, 2KH, 2KI, 2KJ, 2KL, 2KM, 2KN, 2KO, 2KP, 2KQ, 2KR, 2KS, 2KT, 2KU, 2KV, 2KW, 2KX, 2KY, 2KZ, 2LA, 2LB, 2LC, 2LD, 2LE, 2LF, 2LG, 2LH, 2LI, 2LJ, 2LK, 2LM, 2LN, 2LO, 2LP, 2LQ, 2LR, 2LS, 2LT, 2LU, 2LV, 2LW, 2LX, 2LY, 2LZ, 2MA, 2MB, 2MC, 2MD, 2ME, 2MF, 2MG, 2MH, 2MI, 2MJ, 2MK, 2ML, 2MN, 2MO, 2MP, 2MQ, 2MR, 2MS, 2MT, 2MU, 2MV, 2MW, 2MX, 2MY, 2MZ, 2NA, 2NB, 2NC, 2ND, 2NE, 2NF, 2NG, 2NH, 2NI, 2NJ, 2NK, 2NL, 2NM, 2NN, 2NO, 2NP, 2NQ, 2NR, 2NS, 2NT, 2NU, 2NV, 2NW, 2NX, 2NY, 2NZ, 2OA, 2OB, 2OC, 2OD, 2OE, 2OF, 2OG, 2OH, 2OI, 2OJ, 2OK, 2OL, 2OM, 2ON, 2OO, 2OP, 2OQ, 2OR, 2OS, 2OT, 2OU, 2OV, 2OW, 2OX, 2OY, 2OZ, 2PA, 2PB, 2PC, 2PD, 2PE, 2PF, 2PG, 2PH, 2PI, 2PJ, 2PK, 2PL, 2PM, 2PN, 2PO, 2PP, 2PQ, 2PR, 2PS, 2PT, 2PU, 2PV, 2PW, 2PX, 2PY, 2PZ, 2QA, 2QB, 2QC, 2QD, 2QE, 2QF, 2QG, 2QH, 2QI, 2QJ, 2QK, 2QL, 2QM, 2QN, 2QO, 2QP, 2QQ, 2QR, 2QS, 2QT, 2QU, 2QV, 2QW, 2QX, 2QY, 2QZ, 2RA, 2RB, 2RC, 2RD, 2RE, 2RF, 2RG, 2RH, 2RI, 2RJ, 2RK, 2RL, 2RM, 2RN, 2RO, 2RP, 2RQ, 2RR, 2RS, 2RT, 2RU, 2RV, 2RW, 2RX, 2RY, 2RZ, 2SA, 2SB, 2SC, 2SD, 2SE, 2SF, 2SG, 2SH, 2SI, 2SJ, 2SK, 2SL, 2SM, 2SN, 2SO, 2SP, 2SQ, 2SR, 2SS, 2ST, 2SU, 2SV, 2SW, 2SX, 2SY, 2SZ, 2TA, 2TB, 2TC, 2TD, 2TE, 2TF, 2TG, 2TH, 2TI, 2TJ, 2TK, 2TL, 2TM, 2TN, 2TO, 2TP, 2TQ, 2TR, 2TS, 2TT, 2TU, 2TV, 2TW, 2TX, 2TY, 2TZ, 2UA, 2UB, 2UC, 2UD, 2UE, 2UF, 2UG, 2UH, 2UI, 2UJ, 2UK, 2UL, 2UM, 2UN, 2UO, 2UP, 2UQ, 2UR, 2US, 2UT, 2UU, 2UV, 2UW, 2UX, 2UY, 2UZ, 2VA, 2VB, 2VC, 2VD, 2VE, 2VF, 2VG, 2VH, 2VI, 2VJ, 2VK, 2VL, 2VM, 2VN, 2VO, 2VP, 2VQ, 2VR, 2VS, 2VT, 2VU, 2VV, 2VW, 2VX, 2VY, 2VZ, 2WA, 2WB, 2WC, 2WD, 2WE, 2WF, 2WG, 2WH, 2WI, 2WJ, 2WK, 2WL, 2WM, 2WN, 2WO, 2WP, 2WQ, 2WR, 2WS, 2WT, 2WU, 2WV, 2WW, 2WX, 2WY, 2WZ, 2XA, 2XB, 2XC, 2XD, 2XE, 2XF, 2XG, 2XH, 2XI, 2XJ, 2XK, 2XL, 2XM, 2XN, 2XO, 2XP, 2XQ, 2XR, 2XS, 2XT, 2XU, 2XV, 2XW, 2XX, 2XY, 2XZ, 2YA, 2YB, 2YC, 2YD, 2YE, 2YF, 2YG, 2YH, 2YI, 2YJ, 2YK, 2YL, 2YM, 2YN, 2YO, 2YP, 2YQ, 2YR, 2YS, 2YT, 2YU, 2YV, 2YW, 2YX, 2YY, 2YZ, 2ZA, 2ZB, 2ZC, 2ZD, 2ZE, 2ZF, 2ZG, 2ZH, 2ZI, 2ZJ, 2ZK, 2ZL, 2ZM, 2ZN, 2ZO, 2ZP, 2ZQ, 2ZR, 2ZS, 2ZT, 2ZU, 2ZV, 2ZW, 2ZX, 2ZY, 2ZZ, 2AA, 2AB, 2AC, 2AD, 2AE, 2AF, 2AG, 2AH, 2AI, 2AJ, 2AK, 2AL, 2AM, 2AN, 2AO, 2AP, 2AQ, 2AR, 2AS, 2AT, 2AU, 2AV, 2AW, 2AX, 2AY, 2AZ, 2BA, 2BB, 2BC, 2BD, 2BE, 2BF, 2BG, 2BH, 2BI, 2BJ, 2BK, 2BL, 2BM, 2BN, 2BO, 2BP, 2BQ, 2BR, 2BS, 2BT, 2BU, 2BV, 2BW, 2BX, 2BY, 2BZ, 2CA, 2CB, 2CC, 2CD, 2CE, 2CF, 2CG, 2CH, 2CI, 2CJ, 2CK, 2CL, 2CM, 2CN, 2CO, 2CP, 2CQ, 2CR, 2CS, 2CT, 2CU, 2CV, 2CW, 2CX, 2CY, 2CZ, 2DA, 2DB, 2DC, 2DD, 2DE, 2DF, 2DG, 2DH, 2DI, 2DJ, 2DK, 2DL, 2DM, 2DN, 2DO, 2DP, 2DQ, 2DR, 2DS, 2DT, 2DU, 2DV, 2DW, 2DX, 2DY, 2DZ, 2EA, 2EB, 2EC, 2ED, 2EE, 2EF, 2EG, 2EH, 2EI, 2EJ, 2EK, 2EL, 2EM, 2EN, 2EO, 2EP, 2EQ, 2ER, 2ES, 2ET, 2EU, 2EV, 2EW, 2EX, 2EY, 2EZ, 2FA, 2FB, 2FC, 2FD, 2FE, 2FF, 2FG, 2FH, 2FI, 2FJ, 2FK, 2FL, 2FM, 2FN, 2FO, 2FP, 2FQ, 2FR, 2FS, 2FT, 2FU, 2FV, 2FW, 2FX, 2FY, 2FZ, 2GA, 2GB, 2GC, 2GD, 2GE, 2GF, 2GG, 2GH, 2GI, 2GJ, 2GK, 2GL, 2GM, 2GN, 2GO, 2GP, 2GQ, 2GR, 2GS, 2GT, 2GU, 2GV, 2GW, 2GX, 2GY, 2GZ, 2HA, 2HB, 2HC, 2HD, 2HE, 2HF, 2HG, 2HH, 2HI, 2HJ, 2HK, 2HL, 2HM, 2HN, 2HO, 2HP, 2HQ, 2HR, 2HS, 2HT, 2HU, 2HV, 2HW, 2HX, 2HY, 2HZ, 2IA, 2IB, 2IC, 2ID, 2IE, 2IF, 2IG, 2IH, 2II, 2IJ, 2IK, 2IL, 2IM, 2IN, 2IO, 2IP, 2IQ, 2IR, 2IS, 2IT, 2IU, 2IV, 2IW, 2IX, 2IY, 2IZ, 2JA, 2JB, 2JC, 2JD, 2JE, 2JF, 2JG, 2JH, 2JI, 2JJ, 2JK, 2JL, 2JM, 2JN, 2JO, 2JP, 2JQ, 2JR, 2JS, 2JT, 2JU, 2JV, 2JW, 2JX, 2JY, 2JZ, 2KA, 2KB, 2KC, 2KD, 2KE, 2KF, 2KG, 2KH, 2KI, 2KJ, 2KL, 2KM, 2KN, 2KO, 2KP, 2KQ, 2KR, 2KS, 2KT, 2KU, 2KV, 2KW, 2KX, 2KY, 2KZ

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# 18th A.R.R.L. INTERNATIONAL DX COMPETITION

Phone: February 1-3 and February 15-17.

C.W.: February 28-March 2 and March 14-16

It's time again to ready your station for the A.R.R.L. International DX Competition, to be held in each country and A.R.R.L. section.

An usual, special certificate awards are offered to the top single-operator phone and c.w. scores in each country and A.R.R.L. section. If you're new to the DX Contest, it won't take you long to catch on. During the contest period, stations outside of the U.S. and Canada will call "CQ WVE" or "CQ VE7ST" and will exchange numbers as shown in the sample elsewhere on this page. If the input is 100 watts, your number is 100. If you run only 75 watts, use the number 075. If your input is different on different bands, change the number to approximate the input figure, but don't bother about 0.1 per cent. accuracy on any band—the usual approximation is adequate.

In the telegraph section, only c.w.-c.w. contacts count. Crossband contacts may not be counted.

7 Exchanges: Each station operator will use three figures to represent the approximate transmitter power input. C.w. contestants will exchange six-figure numbers, each consisting of an RST report plus the three "power" numbers. (Examples are given in the sample log.) Phone contestants will exchange five-figure numbers, each consisting of a Readability-Strength report plus the three "power" numbers. If the input power varies considerably on different bands, the "power" number should be changed accordingly.

8 Scoring: (a) Points: 1 point is earned by a W (K) or VE/VO station upon receiving acknowledgment of a number sent, and 1 point upon acknowledging a number received. Two points are earned by any other station upon receiving acknowledgment of a number sent, and 1 point upon acknowledging a number received.

(b) Final Score: W (K) and VE/VO stations multiply total points earned under Rule 8(a) by the number of countries worked on one band plus the number of countries worked on each other band. All other stations multiply total points earned under Rule 8(a) by the sum of the number of W (K) and VE/VO licensing areas worked on one band plus the number of W (K) and VE/VO licensing areas worked on each other band.

9 Countries: Will be those on the A.R.R.L. Countries List. There are 10 licensing areas: 16 in the United States, 9 in Canada (VO, VE1-VE7).

8 Repeat Contacts: The same station may be worked again for additional points if the contact is made on a different frequency band. The same station may be worked again on the same band if the complete exchange for a total of three points was not made during the original contact on that band.

10 Quotas: The maximum number of points per country per band which may be earned by W (K) stations in the c.w. section is 12, and contacts made on the same band with the same country after the quota is filled will not count. Thus complete exchanges with four stations in one country on one band will be the band quota for that country. The maximum number of points per country per band which may be earned by VE/VO stations in the c.w. section is 12, and contacts made on the same band with the same country after the quota is filled will not count. Exchanges with six stations in one country on one band are permitted Canadian participants. There is no quota for stations in the c.w. section outside of the U.S. and Canada. There is no quota for any station in the phone section.

11. Reporting: Contest work must be reported as shown in the sample form. Each entry must include the signed statement as shown in that example. Contest reports must be mailed no later than 18th April, 1968, to the "QST" mailing and awards. All DX Contest reports become the property of the American

Radio Relay League. No contest reports can be returned.

12 Awards: To document the performance of participants in the Eighteenth A.R.R.L. International DX Competition, a full report will be carried in "QST". In addition, special recognition will be made as follows:

(a) A certificate will be awarded to the high scoring single-operator phone and to the high scoring single-operator c.w. entrant in each country (as shown in the A.R.R.L. Countries List and in each of the 27 U.S. and Canadian A.R.R.L. sections from which valid entries are received). In addition, a certificate will be awarded to the high scoring multiple-operator station in each section or country from which three or more valid multiple-operator entries are received.

(b) A suitable certificate will be awarded to the operator making the highest single-operator phone score in each A.R.R.L.-affiliated club, provided the club secretary submits a listing of a minimum of three phone entries by bona fide resident members of such club, and provided further that these scores are confirmed by receipt at A.R.R.L. headquarters of the individual contest logs from such members. The highest single-operator c.w. score in each club will be awarded a certificate under the same conditions.

(c) A.R.R.L. will award a gavel to the affiliate submitting the greatest aggregate phone and c.w. score by bona fide resident club members, whether single- or multiple-operator entries, provided such scores are confirmed by receipt at A.R.R.L. headquarters of the individual contest logs from such members.

13 Judging: All entries will be passed upon by the A.R.R.L. Awards Committee, whose decisions will be final. The Committee will void or adjust entries as its interpretation of these rules may require.

14 Disqualifications: Off-frequency operation as confirmed by a single FCC citation or advisory notice or two A.R.R.L. accredited club operators will disqualify. Low tone reports in logs will also be considered by the A.R.R.L. Award Committee as grounds for disqualification.

## SUMMARY, 18th A.R.R.L. INTERNATIONAL DX COMPETITION

Name	Entry Call (C.W. or Phone)	Country	Bands					Total
			1.5	7	14	27	30	
			Mc.	Mc.	Mc.	Mc.	Mc.	
Transmitter Tubes								
Receiver								
Antenna(s)								
* Loss from foreign countries show number of U.S.A. and Canadian call areas worked.								

No. Bands QSOed	1	4	3	5	Total
Number of Contacts					
No. of Different Countries Worked					
No. of Hours of Station Operation					
Asst. Person(s) Name(s) or Call(s)					
45 x 8 equals 360					
(Points) (Multiplier) Final Score					

I certify, on my honour, that I have observed all competition rules as well as all regulations established for Amateur Radio in my country, and that my report is correct and true to the best of my belief. I agree to be bound by the decisions of the A.R.R.L. Award Committee.

Operator's Signature

\* Figure in this box is multiplier.

## Explanation of DX Contest Exchanges

Exchanges	RST Report Stat'n W/ced	3-Digit No. rep. Power Input
Sample (c.w.)	579	100
Sample (phone)	07	300

## RULES

- 1 Eligibility: Amateurs operating fixed Amateur Stations in any and all parts of the world are invited to participate.
- 2 Object: Amateurs in the continental U.S. and Canada will try to work as many Amateur Stations in other parts of the world as possible under the rules and during the contest periods.
- 3 Conditions of Entry: Each entrant agrees to be bound by the provisions of this announcement, the regulations of its licensing authority, and the decisions of the A.R.R.L. Award Committee.

Entry Classifications: Entry may be made in either or both the phone or c.w. sections; c.w. scores are independent of phone scores. Entries will be further classified as "single- or multiple-operator stations." Single-operator stations are those of which one person performs all the operating functions. Multiple-operator stations are those in which assistance, such as from "spotting" or relief operators, or in keeping the station log and records. A special phone listing is available for those entrants whose work is exclusively in the 10 and/or 11 metre ends.

5 Contest Periods: There are four week-ends each 48 hours long: two for phone work and two for c.w. The phone sections start at 2400 G.C.T., Friday, Feb. 1, and Friday, Feb. 15, ends 2400 G.C.T., Sunday, Feb. 3, and Sunday, Feb. 17. The c.w. section starts at 2400 G.C.T., Friday, Feb. 28, and Friday, March 14; ends 2400 G.C.T., Sunday, March 2, and Sunday, March 16.

6 Contest Contacts: In the phone section, all claimed credits must be made voice-to-voice.

## LOG, 18th A.R.R.L. INTERNATIONAL DX COMPETITION

Sheet 1 of 1. Call: \_\_\_\_\_ A.R.R.L. Section: \_\_\_\_\_ or Country: \_\_\_\_\_

Date and Time	Station Worked	Country	Record of New Countries for Each Band					Serial Numbers		Points
			3.5	7	14	27	30	Sent	Received	
Feb. 2, 0000 GCT	VFPE	Bermuda	1					06575	57006	8
Feb. 3, 1200	PA0GN	Netherlands						1 56375	47075	3
1300	GOCL	England						2 35375	46150	3
1300	PA0RA	Netherlands						3 56375	30800	3
2045	LUTAZ	Argentina						4 56375	57750	3
2310	VEWX	Bermuda	3					5 37000	30800	8
Feb. 16, 1000	ZL1MR	New Zealand						6 30500	50075	3
1005	VE2S	Australia	1					7 37000	46150	3
1105	VK2RA	Australia	1					8 40200	45100	3
1401	PA0IQ	Netherlands						9 56375	57100	3
Feb. 17, 0900	TF3EA	Iceland						10 37000	37000	8
1245	G2MT	England						11 46125	46125	3
1250	G5ST	England						12 56300	57100	3
1250	G5BT	England						13 57375	57100	3
1430	G5BA	England						14 56375	56100	3
2320	K2ZAW	Canal Zone						15 38000	30900	3

Sample of report form that must be used by foreign c.w. and all phone participants.

# FEDERAL, QSL, and DIVISIONAL NOTES

Federal President: G. GLOVER (VK3AG); Federal Secretary: G. M. HULL (VK3BZ); Box 5611W, G.P.O., Melbourne.

## NEW SOUTH WALES

President: John Moyle, VK1JU.  
Secretary: David H. Duff (VK3EO), Box 1734 G.P.O., Sydney.  
Meeting Night: Fourth Friday of each month at Science House, Corner Gloucester and Essex Sts., Sydney.  
Divisional Sub-Editor: Don B. Knock, VK3NO, 43 Yankoo Avenue, Waverley, Sydney.  
Zone Correspondents: North Coast and Tableland, Noel Horner, VK3AHS, Ryan Ave., West Kempsey, Newcastle; Ron McD. Stuart, VK3AB, 58 Dumber St., Stockton, Cessfield and Lakes; Harry Newling, VK3YU, 11, Conn. St., Ave., Cronshaw, Wollara; W. H. SBN, VK3WH, Camblow, Forbes; South Coast and Southern Ray, Raynor VK3DO, 4 Pettit St., Yass, Eastern Suburbs; Don Knock, VK3NO, 43 Yankoo Ave., Waverley, Northern Suburbs; Harry Powell, VK3APY, Russell Ave., Wahroonga, Gosford; J. H. A. Coyne, VK3YK, 54 Carlton Cres., Kogarah Bay.

## VICTORIA

President: G. S. C. Semmens, VK3GG.  
Assistant Secretary: C. Gibson (VK3FO).

## FEDERAL

News is scarce this month. Federal Executive "shut up shop" for the holidays and so, apparently, did all other societies for there was practically no overruns making in from which to glean interesting Amateur information.  
However, Convention time is coming around again for which motions from the Divisions are being made. The 1951 Federal Convention will be held in Sydney during Easter this year and an extra good agenda is looked for to compensate the higher costs of holding it there. There is your chance to bring up that matter you've always wanted to put your motion on for suggestion forward to your Federal Councilor can still reach F.E. in time. But make it good—something really constructive and worthwhile to Amateur Radio as a whole.

## LAST YEAR'S CONVENTION

- In conformity with the policy of the Federal Council of the W.I.A. the action taken by F.E. on the agenda from the 1951 Annual Federal Convention is published herewith for the information of members:—
- Item 1: Agreed at the Convention that the policy book continue in the situation.
- Item 2: Entered in Federal policy book and noted for 1952 Convention.
- Item 3: Entered in Federal policy book.
- Item 4: Greater publicity given to v.h.f. contests to solicit more interest.
- Item 5: Withdrawn by Queensland delegate at Convention.
- Item 6: Motion lost.
- Item 7: Context of editorial, July, 1951, "Amateur Radio". Matter referred to and in the hands of the P.M.G.'s Department.
- Item 8: Arrangements being proceeded with for 1952 Convention.
- Item 9: Clarified at Convention.
- Item 10: Entered in Federal policy book and notified to Divisions.
- Item 11: Motion lost.
- Item 12: Entered in Federal policy book, notified to Divisions and included as first agenda item for 1952 Convention.
- Item 12a: VK3RT determined to be the rightful recipient of the W.A.S. Australia 150 MC Trophy and change the subject to 150—forwarded to the South Australian Division.
- Item 13: All Divisional Presidents requested to include events of historical nature in annual reports and forward a copy to F.E. Divisions asked to cooperate by obtaining historical records from "old timers" in respective States. Some records on hand being co-related by Federal Vice-President.
- Item 14: Printing pending requirements of Divisions after first using balance of individual State forms now on hand.
- Item 15: Submitted to P.M.G.'s Department for information. I.A.R.U. notified. Published elsewhere this issue of "Amateur Radio."
- Item 16: Divisions requested to co-operate by appointing Publicity Officer. Matter further

Administrative Secretary: Mrs. R. May, Law Court Chambers, 191 Queen St., Melbourne.  
Meeting Night: First Wednesday of each month at the Radio School, Melb. Technical College.  
Zone Correspondents: Western: C. G. Waring, VK3YV, 13 Skene St., Stawell; South Western: K. O'Rourke, VK3AKH, Killgrew, Western; North Eastern: J. Tennant, VK3YU, 20 Wilson Ave., Tatura; Far North West: M. Folle, VK3GZ, 101 Lemon Ave., Mildura; Eastern: H. C. Kent, VK3AIK, Timbumba, North Western: C. Case, VK3ACK, Cammell Ave., Birchall.

## QUEENSLAND

President: J. H. Farrell, VK4WJ.  
Secretary: J. F. Pickles, VK3FF, Box 833, G.P.O., Brisbane.  
Meeting Night: Third Friday in each month at the I.R.E. Rooms, Wickham St., Valley.  
Divisional Sub-Editor: Clive J. Cooke, VK4CC, Kurau Street, Chermside, Brisbane.

## SOUTH AUSTRALIA

President: E. A. Barber, VK3MD.  
Secretary: G. M. Bowen, VK3AK, Box 1394K, G.P.O., Adelaide.

- dealt with by editorials and correspondence. Subject on for constant reminder where and when necessary or possible.
- Item 17: Refer F.E. notes, January "A.R." 1952. P.M.G.'s Department approached and matter discussed. Further action pending results of meetings already convened between F.E. and Joint Services Committee.
- Item 18: Editor of "Amateur Radio" notified. Delegates discussed matter with Editor at Convention. Item entered in Federal policy book.
- Item 19: Published August and September "Amateur Radio" in conformity with Federal Constitution, and forwarded to Divisions for vote. Further action pending.
- Item 20 and 20a: Original amendments ratified by Divisions. Subsequent amendments drafted in and final draft forwarded to all Divisions for vote. As at this date VK3, VK4, VK5 and VK7 accepted; VK6 partial accepted, VK3 pending result of members' vote. Further action pending.
- Item 21: Item lapsed for want of seconder.
- Item 22: Item withdrawn by Queensland delegate.
- Item 23: Item withdrawn by Queensland delegate.
- Item 24: Matter clarified at Convention. Divisions requested to continue with reports. Further action pending.
- Item 25: Request refused by P.M.G.'s Department. Main reason given to be representation from National Committee for Protection of Citizens Rights during war years.
- Item 26: Immediate agreement refused, but the Department agreed to obtain details of New Zealand system and discuss the matter further. Action pending.
- Item 27: Sub-Committee co-opted from Queensland Division. Further suggestions forwarded from F.E. Action pending.
- Item 28: Motion lost.
- Item 29: Matter discussed at Convention.
- Item 30: Draft prepared. Further action pending financial position improving. Amendment to rules delayed until new form in publication.
- Item 31: Motion lapsed for want of seconder.
- Item 32 and 33: New South Wales Division Contest Committee co-opted to function as Federal Contest Committees for the 1952 Committee functioned and conducted contests.

## W.I.A. ACTIVITIES CALENDAR

- Feb. 1-3 and 16-17: C.W. Section of 18th A.I.R.L. International DX Camp.
- Feb. 15: Convention motions from Divisions due in F.E.
- Feb. 28: Convention per capita due with F.E. end of fiscal year of Divisions.
- Feb. 29-Mar. 2 and Mar. 16-16: Phone Session of 18th A.R.L. International DX Camp.

Meeting Night: Second Tuesday of each month at 17 Wymouth St., Adelaide.  
Divisional Sub-Editor: W. W. Parsons, VK3PS, 10 Victoria Avenue, Rose Park.

## WESTERN AUSTRALIA

President: J. Campbell-Watson, VK4JW.  
Secretary: E. R. Lang, Box 7102, G.P.O., Perth, W.A.  
Meeting Place: Perth Technical College Annex, Mounts Bay Road, Perth.  
Meeting Night: Second Monday of each month.  
Divisional Sub-Editor: R. H. Atkinson, VK5WZ, Box 127, Geraldton, W.A.

## TASMANIA

President: R. O'May, VK3OM.  
Secretary: L. W. Edwards, VK3LE, Box 27B, G.P.O., Hobart.  
Meeting Night: First Wednesday of each month at the Photographic Society's Rooms, 163 Liverpool St., Hobart.  
Divisional Sub-Editor: S. Excell, VK3NJ, 77 Mole St., Hobart, Tasmania.  
Zone Correspondents: Northern: C. A. Cullinan, VK3YCW, 12 Montrose Place, Launceston; North Western: R. K. Wilson, 4 Menai St., Burnie, Tasmania.

- Items 34, 35 and 36: Withdrawn by delegates.
- Item 37: Federal Contest Committee advised. Motion later rescinded by vote of Federal Council in favour of scoring system used by the A.R.L.
- Item 37: Attached to minutes of Convention as per the motion.
- Item 38: Entered in Federal policy book and Divisions notified accordingly. Federal Contest Committee advised of contents changed to incorporate where applicable.
- Item 39: Discussed at Convention.
- Item 40: Printed and forwarded to all Divisions for use in 1951 S.D. Contest. Divisions charged on per capita basis to defray cost. Further action pending financial position. Entered in Federal policy book and Divisions notified accordingly.
- Item 41: Federal Contest Committee advised and R.D. Contest rules amended to incorporate.
- Items 42 and 43: Withdrawn by delegates.
- Item 44: Original motion withdrawn as written as per the minutes of the Convention. Necessary equipment purchased and Divisions notified.
- G.B. Item 1 and 1a: Items discussed at Convention. Item 1 entered in Federal policy book. Meetings held with R.A.F. Headquarters. Arrangements made for R.A.F. personnel to speak at Divisional meetings, etc.
- G.B. Item 2: Meetings held with Taxation authorities. Representations made to Canberra. Matter addressed in editorial. Further action pending.
- G.B. Item 3: Entered in Federal policy book.
- G.B. Item 4: Clarified at Convention.
- G.B. Item 5: Published in August and September "Amateur Radio" and included in Federal Constitution, and forwarded to Divisions for vote. Further action pending.
- G.B. Item 6: Item withdrawn by delegate.
- G.B. Item 7: P.M.G. would not accept unless endorsed as "letter-card" as classified by the Department. "73 and best wishes" followed by signature of sender constitutes a letter-card. Matter difficult. Further action pending.
- G.B. Item 8: Department would not agree for reasons given last year.
- G.B. Item 9: Equipment purchased and Divisions notified.

## FEDERAL VICE-PRESIDENT VISITING

### NEW ZEALAND

Federal Vice-President Gordon Weynton, VK3XU, expects to be on a business trip to New Zealand by the last of the year. This is an admirable occasion for an officer of the W.I.A. to pay a goodwill visit to our neighboring I.A.R.U. and Gordon has signified his willingness to carry with him a letter of introduction to the N.Z.A.R.T. with which he hopes to have the opportunity of officially and personally conveying the good wishes of the members of the W.I.A.

## NEW SOUTH WALES

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## SOUTH COAST AND SOUTHERN

During this month we have had a few visitors through the village. Jeff BQJ, who had been on holidays at Narooma, stopped to say hello and yarn about Ham Radio. BQJ/P was active from the seaside and made many contacts. Peter 2A2P also called and had a contact with BQJ. The car developed a fault and Peter and John had to spend a night at Mittagong. Rod 3ACU was next visitor, he and his family and mother stopped overnight at Yass before moving on to Adelaide. Cecil 2A1S has been away to Sydney and spent nearly two weeks at Mentoring. Except for a brief visit to 3P7 surfing was the main attraction. Ron 2PM has plenty of gear in working condition and the grid dip sec. is quite a nice and effective piece of gear. Recently constructed an 815 final but the 144 Mc. beam appears to have seen better days.

Les 3PT is putting out a fine signal, we understand that one of his eyes is becoming affected from the shock of 10,000 volts he received some time ago. We all hope the effects are only of a temporary nature. 3TV and 2ASB both have been active on 40 and Bob 2TV is building some 144 gear. No doubt another beam will be on the top of the 10 m. job. 2A1E. Les certainly puts out a nice signal, it's very effective when the hand is noisy. 2TR and 2HM have not been so active of late, although 2RS seems always to be working VK3 stations.

Down the South Coast 2DY 2AMW and 2ASJ active, 2A1B occasionally heard on 40. Landline 2OK has picked up at Dapto and left for England where he will do a two-year course—Ham Radio we believe is out until his return—the best of luck Landline.

## VICTORIA

### SOUTH WESTERN ZONE

Things have been pretty quiet this month on the air and as far as I'm concerned, in occupation, extremely busy. Having made my excuses for the absence of S.W. Zone news in January issue and for the scarcity in this, I shall endeavour now to piece together a few lines for the second magazine in 1952. The only one I have heard 3HQ this month was on the only zone hook-up which I was able to participate. Neil has been out on seasonal farm operations—seems quite happy with the a.c. on the rig. 3AGD and 3II pretty quiet of late and

not worth to report this month from Dunkeld. Nothing heard from Warrnambool area nor from Colac. 3A2N made a brief appearance on 80 on New Year's eve and wished the zone a happy and prosperous New Year.

3ASU and family spent their annual vacation at Wyre River surfing and fishing, hope there wasn't too many "dummers" Jack. I did hear that 3RW was going down there too. What's this I hear about YL, a double Johanna? BQJ, of Arrarat, has been on the air a little lately and by all accounts had a whale of a time on the ground. Australia by car trip last year. Kevin is talking about crocodile shooting on the Gulf of Carpentaria this year—might be with him too. Incidentally, 3AKR's New Year resolution for 1952 is for better and more consistent news, hi. 73 and the best for 1952 chaps.

### NORTH EASTERN ZONE

3ALF has a new beam motor working, a new antenna to go up as soon as he can get away from the gardening. 3IJ still trying to get poles up along with 3CT who has 10 and 8 m. beams to erect. Looks like the gang, 3APP, 3UT, and 3JC, will have to go a touring and help the boys. 3IZ playing with 8 m. converter in between contacts. 3IJ enjoying himself immensely on 8 m. one evening. 3KR has another convert to the ranks, best wishes Rex.

Zone hook-up conditions not so good, 3IZ heard VK9 on 6 m., didn't think anything of it. How could you Peter, the only one on 6 m. in existence so I'm told. 3KR's Rx on the blink, hope you found the fault Ken. Howard 3JV still managing to get out for a few QSOs every Saturday and Sunday. Howard has "Radio," "CQ," and "QST" magazines, yours for the asking if there is any left. 2AT looked in on hook-up for a few minutes, Alec has been working them on 4 m.

3UT had a visitor from VK3. 3JC still managing a little DX. 3FD now on phone, enough said. Andy how could you? 3DW, ex-zone member, is now working 2 m. I hear. 3FK also on 8 and 2 m. 3IJ and 3JC visited 3UT for Xmas evening, many broached 30V were left in the wake of a very pleasant evening. 3CT working very hard at a back-to-Nagambie week, finished up in bed.

### EASTERN ZONE

Well, well, it's happened at last, 3AHK has gone walkabout and left his poor old assistant

to do the notes. Not a great deal to report this month, however will see what we can do. 3PS working on a new rig, looking forward to hearing it in action. Ron 3ALA hasn't got that modulator finished yet when is it going to be finished Ted? The 2001? Speaking of the year 2001, 3AHK has been talking about a new rig for a long time now.

Good roll ups on 3550 Kc lately keep it up on the emergency network these days. Go to it chaps, 10.30 a.m. Sunday, most important at this time of the year you know. Happy to report that Mrs. 3WZ is well and strong once again. 3BS on 28 m. for the first time since 1938, good on you David, show Dad how to get that DX. 3JC getting very interested in mobile antennae, it won't be long now.

3IZ and associate John Batterick on seven weeks' holiday, you lucky people! 3TH a big-game hunter these days since the flying force invaded his orchard. 3AHK still complaining about being overworked. 2ABF working on his radio-controlled aircraft, what about franking the rig up again Arthur. 3AGP going to VK4. I think he must be trying to get away from the b.c.l., might find plenty of QRN though. 3ANC working on his rig stick to it Norm, we want to hear you again, soon. 3DI working VK6 on 6 m., nice work Jim. Glad to hear you back on 3550 Kc, again, what about the rest of the 6 m. gang now.

The Sale Radio Club held a most enjoyable Xmas meeting at the home of 3AHK. Hums and associates travelled up to 80 miles to be present, and believe you me, it was worth it. Bill 3TV gave a most interesting talk on antennas and answered many questions on the subject. Incidentally Bill had his south contact during the month. After Bill's talk there were refreshments, to cheer the inner-man, including a magnificent Xmas cake prepared by Mrs. 3SS. Well so long for now, we'll have Ossie back next month—I hope!

### CENTRAL WESTERN ZONE

A Christmas visitor to the zone was pre-war 3TC, of Supanup from 3FK. Tom is back into civilian life now and mainly interested in 144 and 80 Mc. (says you can at least have a decent yarn there). While in Uruwau he ran a 144 Mc. test from Big Hill in an endeavour to contact Melbourne, n.g. that way, but he

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Amateur Radio, February, 1952

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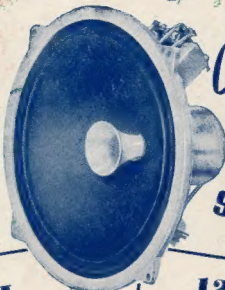


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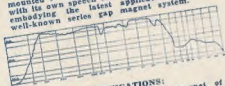
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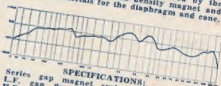


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